



ML1309 Programming and Numerical Tools 6.0 credits

Programmering och numeriska verktyg

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the student should be able to:

- Formulate simple algorithms for given problems and transfer these to program code
- Use a development environment to write, execute and troubleshoot a programme.
- Introduce and use data types and variables also composite, for storing of data
- Be able to carry out simple program design, i.e. deconstruct problems in partial problems, implement function by function and test step by step, with choice of appropriate test data
- Use external files for data storage
- Use programmes or software libraries to solve numerical problems
- Interpret, compare and discuss results with regard to increment, truncation errors etc
- Implement algorithms for numerical integration, solution of equations and ordinary differential functions and linear equation system, in program code.

Course contents

Programming:

- Background and introduction to programming language
- Data types, variables, references
- Operators
- Sequence, selection, repetition
- A and multidimensional variables
- Functions, modular programming
- Problem analysis, structuring, troubleshooting and testing
- Text handling
- File management
- The efficiency of different implementations

Numerical tools:

- Representation of real numbers and truncation errors
- Numerical integration
- Numerical solution of equations
- Numerical solution of ordinary differential equations
- Numerical solution of system of linear equations

Disposition

- Lectures
- Computer exercises
- Presentation of computer exercises
- Examination

Course literature

Litteratur meddelas senast fyra veckor innan kursstart.

Examination

- TEN1 - Written examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- DÖV1 - Computer exercises, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

• TEN1- Examination, 3 credits, grading scale: A-F

• DÄ-V1- Computer exercises, 3 credits, grading scale: A-F

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.